



NextGen Works for America:

Chief NextGen Officer Update to Congress



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NEXTGEN WORKS FOR AMERICA:

Chief NextGen Officer Update to Congress

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NextGen — an initiative to transform the way we fly — is on its way to fruition. In the past 12 months we have reached several key milestones in our multi-billion dollar transformation of the U.S. air transportation system. Through a combination of 21st century technology, new procedures, training and policy updates, we are building a more dynamic, scalable, networked and fully digital aviation system.

Our achievements, in many cases, have been the result of close collaboration with our stakeholders to understand their concerns and priorities and work together to deliver benefits.

WE'VE COMPLETED MAJOR PROGRAM MILESTONES

- En Route Automation Modernization (ERAM), the platform on which data sharing, digital communications and trajectory-based operations will reside, is now fully deployed at all 20 FAA en route air traffic control centers in the continental United States. ERAM processes flight and surveillance data, and provides communications and generates aircraft display data, improving situational awareness for air traffic controllers. ERAM enables better decision making and safer, more efficient routing of aircraft. We are focusing next on providing additional ERAM software releases to support future airspace capabilities.
- The Terminal Automation Modernization and Replacement (TAMR) program converts terminal air traffic control facilities to a single, common automation platform. TAMR is funding a technology refresh at 55 sites while replacing older automation platforms at 108 other facilities. Full deployment of TAMR will be completed in 2020.
- Automatic Dependent Surveillance–Broadcast (ADS-B) is now integrated at 22 of the 24 en route centers. Aircraft operating in most controlled U.S. airspace must be equipped for ADS-B Out by January 1, 2020. To date, more than 11,000 aircraft have been outfitted with the proper avionics. The value of ADS-B will grow as more aircraft equip prior to the 2020 deadline.
- In fall 2014, we made the final investment decision to develop the National Airspace System Voice System (NVS), which replaces the current voice switches operated independently at individual facilities. NVS will provide us with a nationwide capability for routing, monitoring and sharing communication assets among facilities.
- Prototype Data Communications (Data Comm) equipment, which is the first step toward transitioning pilot-controller communications from voice to data, has been used at Memphis and Newark airports since 2013. We plan to provide Data Comm at 56 airports by 2016, three years ahead of the program's baseline schedule.
- We developed more robust information sharing to support collaborative decision making. One element of Terminal Flight Data Manager, the Surface Visualization Tool, achieved initial operating capability in spring 2014. In fall 2014, we began offering industry access to data from FAA's Time-Based Flow Management and Traffic Flow Management System (TFMS) programs over our System Wide Information Management (SWIM) network. With SWIM in place, we need to be ready to meet expanded demand as our stakeholders discover all the potential benefits that SWIM has to offer.



These programs form the basis for all other NextGen capabilities through software and hardware upgrades and data exchanges. As we complete the infrastructure, we can focus on delivering even greater benefits.

WE COLLABORATED WITH STAKEHOLDERS TO ENCOURAGE ADS-B EQUIPAGE AND PRIORITIZE COMMITMENTS

ADS-B and Equip 2020

We have completed the infrastructure for ADS-B. Stakeholders must outfit their aircraft to complete the picture. In order to encourage equipage well before the 2020 deadline, we held a Call to Action summit in October 2014 for stakeholders and established Equip 2020. Equip 2020 is a government-industry steering group charged with addressing some of the challenges surrounding equipage, which include cost, equipment availability, and installation schedule. Representatives from the airlines, manufacturers, the general aviation community and all the major trade associations attended the summit and pledged to work with us to meet the deadline.

Equip 2020 worked to address the cost concerns voiced by the general aviation community. Competition among avionics manufacturers has led to a dramatic cost reduction on equipage — more than a 50 percent price drop since October. Several sources now exist for units at prices lower than \$2,000.

NextGen Priorities

Ongoing collaboration with our stakeholders is key to our success. We are listening to their concerns and working with them to refine plans and measure benefits. Along with our own assessments, we are focused on leveraging advice to further bolster NextGen momentum. For example, the 2014 MITRE report on NextGen implementation showed we made significant progress since 2008 and validated our focus on transitioning from executing programs to delivering capabilities.

Our efforts with the NextGen Advisory Committee (NAC) provide an excellent example of what we can accomplish when stakeholders and government work together. This 31-member federal advisory committee provides policy guidance to the FAA on NextGen implementation issues facing the aviation community. The NAC includes representatives from the airlines, airports, general aviation, manufacturers, pilots, air traffic controllers, the Department of Defense, environmental interests, international interests and air traffic control.

**“NEXTGEN —
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In 2014, we partnered with the NAC on a joint implementation plan that prioritized four NextGen areas where we can deliver concrete benefits over the next three years. We identified timelines, milestones, locations, costs and metrics for these areas. To date, we have delivered on 19 commitments — three ahead of schedule. Highlights from this work include:

1. Performance Based Navigation

Performance Based Navigation (PBN) uses satellites to enable pilots to fly with greater accuracy and efficiency. We have established a network of thousands of these precisely defined routes to make the flow of air traffic more efficient. We are working closely with operators in local areas to design routes that provide the greatest possible benefit. We have established these new routes in metroplexes throughout the country for all phases of flight: departure, en route, arrival and final approach.

We are receiving positive feedback about new Established on Required Navigation Performance (EoR) procedures we began testing at Denver in spring 2015. EoR enables controllers to reduce the separation between approaching aircraft, and for operators to fly shorter, more direct flight paths that save fuel, cut aircraft exhaust emissions and minimize delays.

EoR benefits airports that have parallel runways. Repeatable flight paths and reduced controller/pilot communication enhance safety. We have committed to publishing a national standard for EoR in 2017, which will make it possible to

implement it at eligible locations throughout the NAS.

Equivalent Lateral Spacing Operations (ELSO) enables controllers to space the routes of PBN-equipped aircraft closer together and safely clear aircraft for takeoff more efficiently because of the increased precision of PBN paths. ELSO translates to millions of dollars in fuel savings per year — nearly \$20 million dollars per year in Atlanta. We plan to issue a national standard in June 2015 that will allow us to expand these benefits to other locations.

2. Data Communications

We have proven the operational feasibility of Data Comm thanks to ongoing testing at Memphis and Newark towers. Our commitment to deploy Data Comm at 56 airports begins this summer at Salt Lake City, Houston Intercontinental and Houston Hobby. The plan includes aggressive completion dates with a goal for deployment to be finished by the end of 2016, which is three years ahead of the official FAA baselined schedule.

Data Comm enables pilots to communicate digitally with controllers using a screen on the flight deck instead of radio. It offers significant benefits in safety and efficiency. Digital messages range from initial contact with a controller in a new sector to revised clearances from the controller telling the pilot to fly a new route or change altitude.

Data Comm provides a data link between ground automation and flight deck avionics for air traffic control clearances, instructions, traffic flow management and flight crew requests. Data Comm instructions are clear, quick and concise. Pilots read the instructions and with the push of a button load the message into the avionics and confirm to the controller that they will comply.

Data Comm provides many benefits to operators including improved efficiency, increased flexibility, reduced delays, reduced aircraft exhaust emissions, increased throughput and improved safety. The time saved by receiving digital clearances instead of voice instructions can make the difference between getting airborne before a thunderstorm closes the departure corridor and

being stuck on the ground waiting for the storms to pass.

Our stakeholders have placed a high value on the en route component of the Data Comm program. We will begin introducing an initial set of en route services in 2019, and will make a final investment decision on the full suite of services later in 2015.

3. Improved Multiple Runway Operations

The efficiency of parallel runways, particularly those that are closely spaced, is limited by the interplay of wake vortices from nearby aircraft. By using Improved Multiple Runway Operations (IMRO) procedures and deploying wake recategorization (Wake Recat), we have lessened airport delays and increased capacity by safely reducing separation standards for dual and independent parallel runway operations.

Wake Recat is already making a difference at Atlanta Hartsfield-Jackson International Airport. The new standards, implemented in June 2014, allow tighter arrival and departure sequences, resulting in smoother surface flows and flight efficiency improvements especially during peak periods. Delta Airlines reports a range of 0.5-2 minute shorter taxi times for departures, and 0.5-1 minute shorter times in descent for arrivals. The airline estimates an annual operational cost savings of \$14.8 to \$38.1 million.

4. Surface Operations and Data Sharing

Some of the greatest efficiencies NextGen provides involve enhancements to surface operations and data sharing. SWIM offers easy access to a wide range of air traffic control and management information. Users of the NAS can tap into the information they need, when they need it, through a single connection. SWIM relies on a standard data format to more efficiently share information from disparate computer systems. Airlines no longer need to look at numerous sources to access weather and surface operations information. Stakeholders can also capitalize on SWIM-distributed air traffic control data to develop new software products that serve the aviation community.

With SWIM, the FAA and airlines can collaborate more effectively on daily flow control decisions.

Several major airlines, airports, companies and air traffic control research laboratories are already connected to SWIM and using the information.

We began offering a new SWIM-enabled information capability based on TFMS in 2014. TFMS monitors demand and capacity information, assesses the impact of system constraints, provides alerts and helps determine appropriate adjustments. Access to TFMS provides SWIM users with traffic data and flow information, including ground delays, ground stops, reroutes and traffic advisories.

We have made significant progress with Advanced Electronic Flight Strips (AEFS). At many airport towers, controllers use traditional paper flight strips, which record the progress of a flight, as they pass the flight from one controller to another. With AEFS, they will be able to use electronic messages on touch screens, improving coordination among controllers, traffic management units and front line managers. AEFS was implemented at Cleveland tower this year and will be delivered to Las Vegas and San Francisco towers in 2016. At the NAC's request, we assessed the feasibility of using AEFS in the New York region and decided to introduce the tool to the Newark tower in mid-2016.

WE'RE PARTNERING WITH GOVERNMENT AGENCIES ON NEXTGEN'S NEXT STEPS

The FAA's Interagency Planning Office (IPO) enables improved insight into the complexity of NextGen. The IPO plays a unique role by working hand-in-hand with our federal partners — NASA and the departments of

Transportation, Defense, Commerce and Homeland Security — to prioritize research and integrate individual agency programs into a cross-functional NextGen environment. It was established this past year after Congress eliminated funding for the Joint Planning and Development Office, which had been responsible for multi-agency NextGen coordination.

The IPO is developing a far-term Unmanned Aircraft System vision and addressing NextGen cybersecurity issues. The FAA faces cybersecurity challenges such as protecting air traffic control systems and aircraft avionics, and clarifying cybersecurity roles and responsibilities among multiple FAA offices. Part of the IPO's role is leveraging expertise from academia and industry through its partnership with the NextGen Institute to address these cybersecurity issues.

LOOKING AHEAD

Although we have made significant progress in the past year by completing several of the keystones of NextGen and laying our foundation, NextGen is an ongoing transformation. Our progress depends on a shared vision of a better air transportation system driven by government-stakeholder collaboration, continuous funding from Congress and diligent work.

NextGen remains on track. The progress we have made in the past year is now starting to provide significant benefits to the traveling public. These benefits — in efficiency, economy and the environment — will be demonstrated and increase exponentially as we move ahead with NextGen.



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